

1300 nm OPTICAL ANALOG CATV SYSTEM $\phi 80 \mu\text{m}$ InGaAs PIN PHOTO DIODE WITH SMF

NDL5481P SERIES

FEATURES

- **SMALL DARK CURRENT:**
 $I_D = 0.1 \text{ nA}$
- **SMALL CAPACITANCE:**
 $C_T = 0.7 \text{ pF}$
- **HIGH QUANTUM EFFICIENCY:**
 $\eta = 81\%$ at $\lambda = 1300 \text{ nm}$
- **DETECTING AREA SIZE:**
 $\phi 80 \mu\text{m}$
- **COAXIAL MODULE WITH SINGLE MODE FIBER:**
SM-9/125
- **LOW OPERATING VOLTAGE:**
 $V_R = 10 \text{ MV}$
- **OPTICAL RETURN LOSS:**
45 dB
- **LOW INTERMODULATION DISTORTION:**
 $\text{IMD}_2 = -75 \text{ dBc MAX}$
 $\text{IMD}_3 = -90 \text{ dBc MAX}$

DESCRIPTION

The NDL5481P Series is an InGaAs PIN photo diode module with single mode fiber. It is designed for analog transmission systems like CATV applications, and features low intermodulation distortion and 40 dB minimum of optical return loss.

ELECTRO-OPTICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$)

PART NUMBER PACKAGE OUTLINE			NDL5481P Series		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I_D	Dark Current, $V_R = 10 \text{ V}$	nA		0.1	1.0
C_t	Terminal Capacitance, $V_R = 10 \text{ V}$, $f = 1 \text{ MHz}$	pF		0.7	1.0
η	Quantum Efficiency, $\lambda = 1300 \text{ nm}$	%	76	81	
S	Responsivity, $\lambda = 1300 \text{ nm}$	A/W	0.80	0.85	
f_c	Cut-off Frequency, $V_R = 10 \text{ V}$, $\lambda = 1300 \text{ nm}$, $R_L = 50 \Omega$	GHz	2.5		
ORL	Optical Return Loss, $\lambda = 1300 \text{ nm}$	dB	40	45	
IMD_2	2nd Order Intermodulation Distortion, $\lambda = 1300 \text{ nm}$, 2 Laser 2 Tone Test, $V_R = 10 \text{ V}$, $\text{OMI} = 50\%/\text{LD}$, $P_{IN} = 0.5 \text{ mW}$, $f_1 = 187.25 \text{ MHz}$, $f_2 = 193.25 \text{ MHz}$	dBc			-75
IMD_3	3rd Order Intermodulation Distortion, $\lambda = 1300 \text{ nm}$, 2 Laser 2 Tone Test, $V_R = 10 \text{ V}$, $\text{OMI} = 50\%/\text{LD}$, $P_{IN} = 0.5 \text{ mW}$, $f_1 = 187.25 \text{ MHz}$, $f_2 = 193.25 \text{ MHz}$	dBc			-90

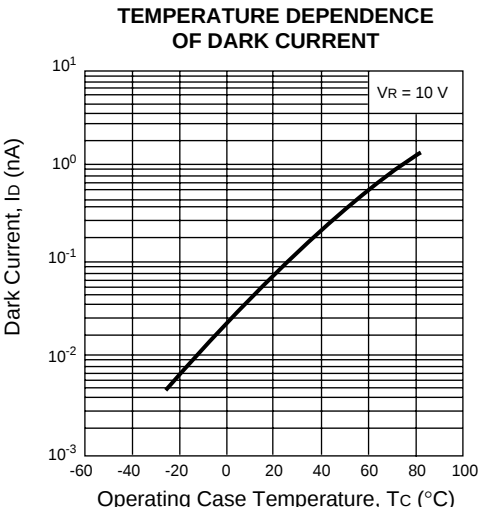
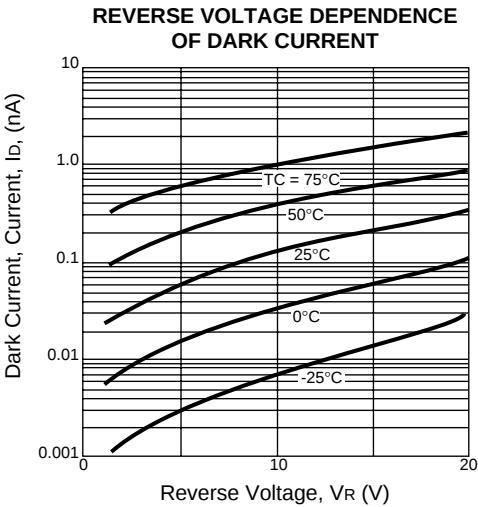
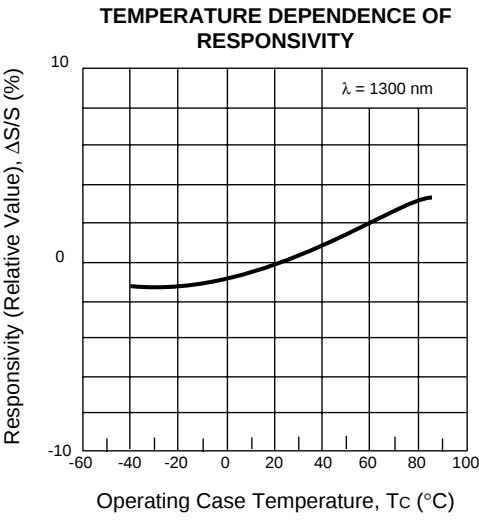
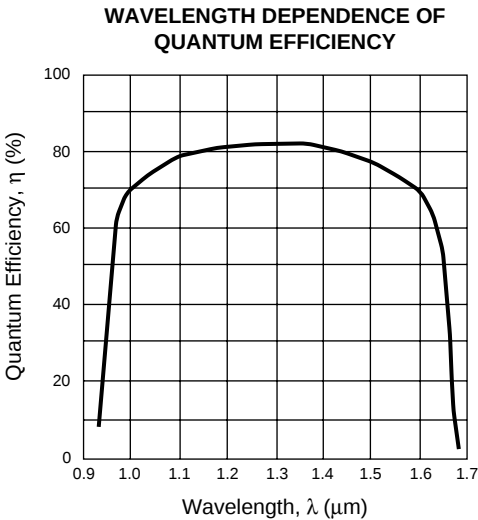
ABSOLUTE MAXIMUM RATINGS¹

(T_C = 25°C, unless otherwise specified)

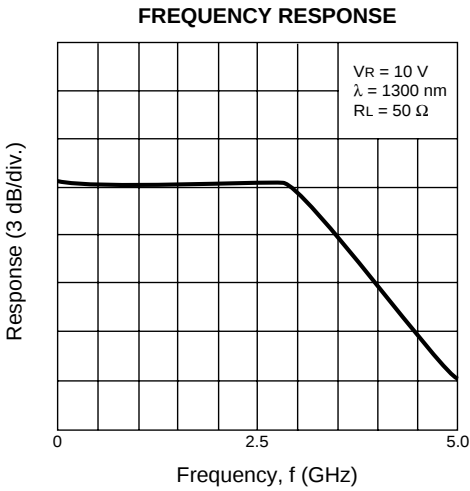
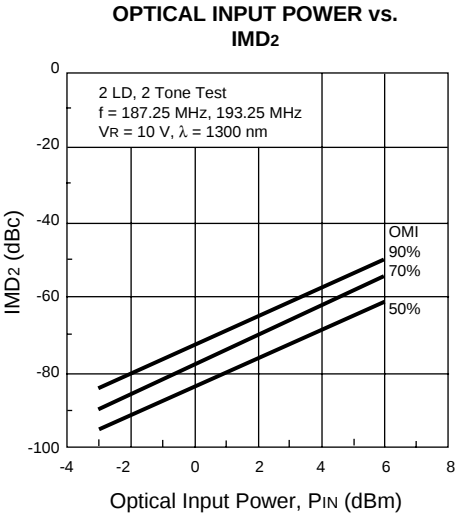
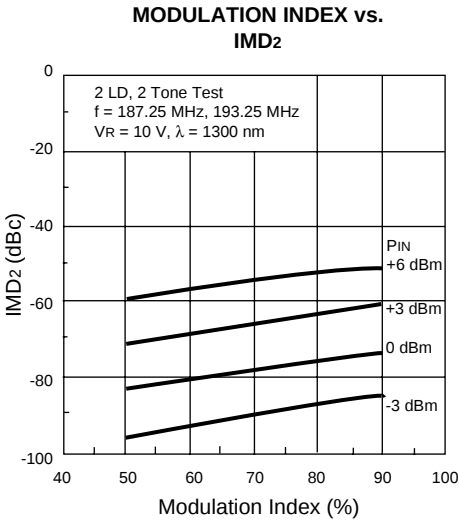
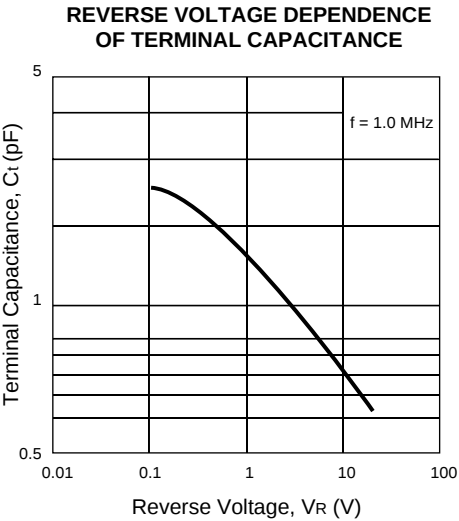
SYMBOLS	PARAMETERS	UNITS	RATINGS
V _R	Reverse Voltage	V	20
I _F	Forward Current	mA	10
P _{IN}	Optical Input Power	mW	8
T _C	Operating Case Temp.	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-40 to +85

- Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

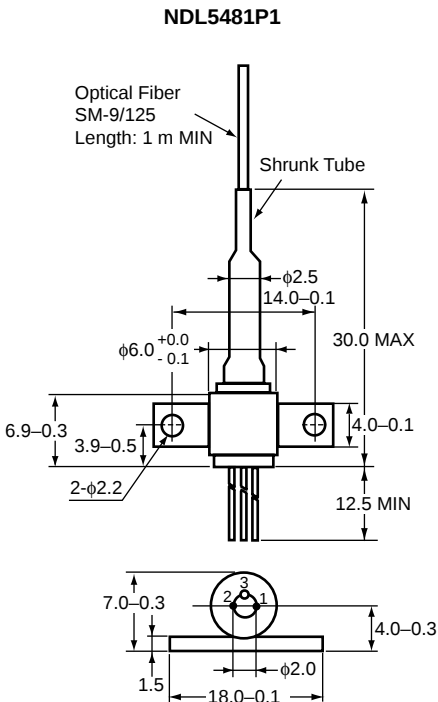
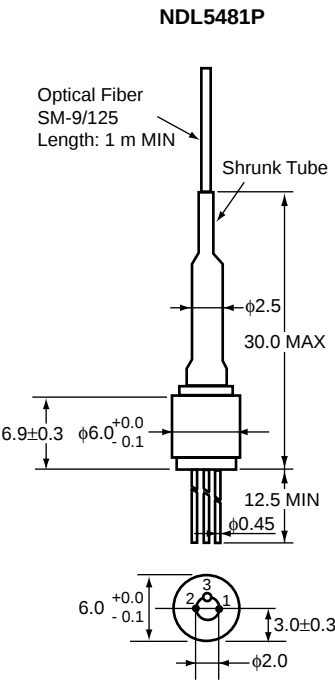
TYPICAL PERFORMANCE CURVES (T_C = 25°C, unless otherwise specified)



TYPICAL PERFORMANCE CURVES (Tc = 25°C, unless otherwise specified)



OUTLINE DIMENSIONS (Units in mm)

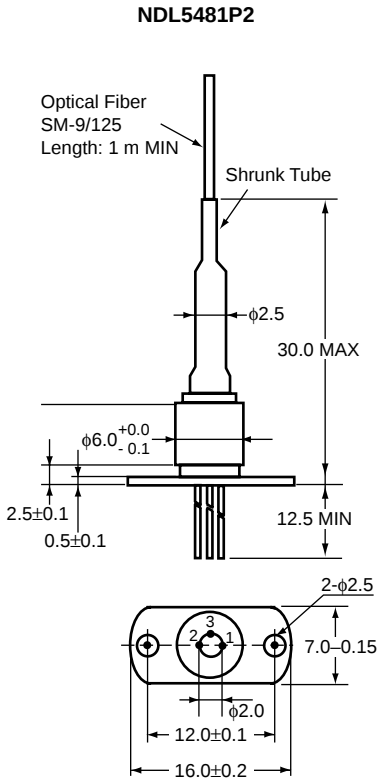


PIN CONNECTIONS

1. Anode (Negative)

2. Cathode (Positive)

3. Case



ORDERING INFORMATION

PART NUMBER	AVAILABLE CONNECTOR	DESCRIPTION
NDL5481P	Without Connector	No Flange
NDL5481PC	With FC-UPC Connector	
NDL5481PD	With SC-UPC Connector	
NDL5481P1	Without Connector	Flat Mount Flange
NDL5481P1C	With FC-UPC Connector	
NDL5481P1D	With SC-UPC Connector	
NDL5481P2	Without Connector	Vertical Flange
NDL5481P2C	With FC-UPC Connector	
NDL5481P2D	With SC-UPC Connector	

HANDLING PRECAUTION FOR PD/APD MODULE

The NEC PD/APD module has heat shrink tubing to protect the ferrule edge (*1) and the junction between the ferrule and the module body (*2). In order to avoid breaking the fiber and/or optical coupling degradation, NEC recommends the following handling precautions:

1. Do not make the fiber bend radius less than 30 mm (*3).
2. Do not bend the fiber within the 18 mm section from the module body (*4).
3. Do not stress the ferrule with a lateral force exceeding 500 g (*5).

